

ABSTRACT OF THE DISCLOSURE

A system and a process for recovering high concentrations of methane from crude natural gas and solid waste landfill exhaust gas uses a sequential combination of a pressure swing adsorber unit operation to remove volatile organic compounds from the crude feed gas mixture followed by a membrane separation unit operation. The membrane separation uses a membrane which is selectively gas permeable to reject transmission of methane and thus to produce a permeate depleted in methane relative to the feed mixture. The permeate is also free of volatile organic compounds and is recycled to the pressure swing adsorber unit operation to regenerate saturated adsorbers.